

CLAIMS

[1] A tire building drum, comprising bead lock means for holding a pair of bead cores and a circular drum core expansively supporting a center portion of a carcass band to define an internal shape of a green tire with an outer contour, the drum core consisting of several rigid segments which are radially expandable/contractible and which are circumferentially adjacent to each other to form said outer contour, wherein, as viewed in a cross sectional plane including a central axis of the drum core, said outer contour has a flat contour portion parallel to the central axis in a widthwise central region and each of the rigid segments has several distance pieces forming at least a part of said flat contour portion and end pieces forming portions of the outer contour widthwise outside of the portion formed by the distance pieces, the distance pieces and the end pieces are aligned in the width direction of the drum core, and wherein said distance pieces are disposed such that their thickness direction is directed to the width direction of drum core and are detachably configured, and the thickness of each of the distance pieces is an mutually identical or different integral multiple (including 1) of the unit thickness.

[2] The tire building drum according to claim 1, wherein said rigid segments comprise a base column supporting the end and distance pieces, a center stopper fixed at the center of the base column in the width direction of the drum core as a base point in the width direction of the drum core, and an end piece fixing means fixing each of the end pieces on the base column, the base column is coupled to a means for radially expanding/contracting the rigid segments, the base column is provided with a guide support portion supporting the end and distance pieces in such a manner that the end and distance pieces can be moved back and forth in the width direction of the drum core, and engagement portion engaging with the guide support portion of the base column are provided on each of the end and distance pieces.

[3] The tire building drum according to claim 1 or 2, wherein a portion forming the outer contour of the rigid segment is configured by arranging comb plates, which mesh with each other between the adjacent segments, in the width direction, and the distance piece having thickness of N times (N is an integral number) of the unit thickness is so configured that it corresponds to N

consecutive comb plates.

[4] The tire building drum according to any one of claims 1 to 3, wherein, as viewed in the section perpendicular to the width direction of the drum core, the guide support portion of the base column consists of a columnar member, the engagement portion of the distance piece consists of a member engaging with the columnar member in male/female manner in the section perpendicular to the width direction, and a cutout portion for releasing the engagement between the base column and the distance piece is provided on the columnar member at the midpoint in its longitudinal direction.

[5] The tire building drum according to any one of claims 1 to 4, wherein the drum is used for building a radial tire.

[6] The tire building drum according to any one of claims 1 to 5, wherein an RFID tag is installed as a means for identifying a size of a current condition.

[7] A tire building system for building a group of tires including tires in different sizes which have mutually different inner widths of green tires, the tire building drum being used for building tires of at least two sizes among said different sizes and according to any one of claims 1 to 6, wherein the number of distance pieces includes zero and one, a total thickness of the distance pieces obtained by summing the thickness of all distance pieces is a given value for every size, and the end pieces are commonly used by these sizes.

[8] A method for setting up a tire manufacturing process, wherein an inner width of a green tire built with the tire building system according to claim 7 is selected from plural widths determined by the total thickness of the distance pieces.

[9] A method of manufacturing a tire built with the tire building system according to claim 7, wherein a green tire is built by the steps of locking each of the bead cores with the corresponding bead lock means; thereafter radially expanding the drum core while approaching the bead lock means with each other to inflate the center portion of the carcass band; turning the side portions of the carcass band around the bead cores toward the outside in the radial direction; radially expanding the drum core with keeping the bead cores locked until it reaches the maximum diameter; and assembling tire components including a tread rubber on the expanded drum core.

[10] A method of manufacturing a tire built with the tire building system according to claim 7, wherein the size of the drum core is varied by changing the total thickness of the distance pieces upon changing the size between green tires having different inner widths.

- 5 [11] A method of manufacturing a tire built with the tire building system according to claim 10, wherein, after the size of the drum core is varied and before the drum core is used, a size-identification code in an RFID tag is updated to the code corresponding to the size after the size has varied.